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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/042,278
Filing Date: January 11, 2002
Appellant(s): ENSEL ET AL.

David E. Moore
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/29/2008 appealing from the Office action mailed 4/3/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) **Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) **Evidence Relied Upon**

5,974,457	Waclawsky et al,	10-1999

Nuansri et al, "An Application of Neural Network and Rule-Based System for Network Management: Application Level Problems" Proceedings of the Thirtieth Hawaii International Conference on System Sciences, 7-10 January 1997, Vol. 5, pgs. 474-483.

(9) **Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1> Claims 1-11, 13, 14, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waclawsky et al. (U.S. Patent Number 5,974,457), hereinafter referred to as Waclawsky, in view of Nuansri et al. ("An Application of Neural Network and Rule-Based System for Network Management: Application Level Problems"), hereinafter referred to as Nuansri.

2> Waclawsky disclosed a system for monitoring data traffic for a data communications network that provides for the establishment and maintenance of a standard of operation. In an analogous art, Nuansri disclosed a hybrid system that combines a neural network module with a rule-based system for monitoring a communications network.

3> Concerning claims 1 and 27-29, Waclawsky did not explicitly state determining possible dependences between devices and services from the training activity parameters. Waclawsky's system determines training activity parameters, analyzes them in different ways, and uses certain properties to determine a normal range or standard of operation for the network. However, he is not specific in terms of properties that relate devices and services to each other. However, Nuansri does explicitly disclose identifying dependences among network services and the service elements or devices as his system focuses on application level problems. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Waclawsky by adding the ability to determine possible dependences between devices and services from the training activity parameters as provided by Nuansri. Here the combination satisfies the need for a network monitoring system that can diagnose problems in more complex domains by using more than only expert system techniques. See Nuansri, pg. 474, section 1. This rationale also applies to those dependent claims utilizing the same combination.

4> Concerning claims 1 and 27-29, Waclawsky did not explicitly state training a neural network as the statistical estimator. Waclawsky's system trains a statistical estimator, but it is rule-based instead of a neural network. However, training a neural network as a statistical estimator was well known in the art as evidenced by Nuansri who system trains a neural network as a statistical estimator to effectuate network monitoring and diagnosing. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Waclawsky by adding the ability to train a neural network as a statistical estimator as provided by Nuansri. Again the combination satisfies the need for a network monitoring system that can diagnose problems in more complex domains by using more than only expert system techniques. See Nuansri, pg. 474, section 1. This rationale also applies to those dependent claims utilizing the same combination.

5> Some claims will be discussed together. Those claims which are essentially the same except that they set forth the claimed invention as a device or a computer-readable storage medium are rejected under the same rationale applied to the described claim.

6> Thereby, the combination of Waclawsky and Nuansri discloses:

- <Claims 1, 27, 28, and 29>

  A method for computer-aided monitoring of a telecommunication network formed of devices capable of communication, said method comprising:

determining training activity parameters, each describing activity of at least one of a corresponding device and a corresponding service (Waclawsky, column 4, lines 13-40);

determining possible dependences between devices and services from the training activity parameters (Waclawsky, column 4, lines 13-40 and Nuansri, pg. 475, section 2);

determining from the possible dependences a normal range of dependence for at least some of the devices and services in essentially undisturbed states to train a neural network as a statistical estimator (Waclawsky, column 4, line 60 through column 5, line 4 and Nuansri, pg. 478, first paragraph);

determining current activity parameters, each describing activity of at least one of a corresponding device and a corresponding service (Waclawsky, column 4, lines 55-58);

comparing the current activity parameters by the statistical estimator with the normal range of dependence (Waclawsky, column 5, lines 5-9); and

determining from said comparing whether at least one of the devices and services in the telecommunication network has a communication performance different from the normal range of dependence in accordance with a predetermined criterion (Waclawsky, column 7, lines 28-34 and column 8, lines 31-38).

- <Claim 2>

  The method as claimed in claim 1, wherein at least some of the devices are constructed as terminals capable of communication (Waclawsky, column 1, lines 17-33).

- <Claim 3>

  The method as claimed in claim 1, wherein the training activity parameters are determined within a predetermined time interval (Waclawsky, column 5, lines 59-64).

- <Claim 4>

  The method as claimed in claim 1, wherein said determining of each training activity parameter is performed by the corresponding device (Nuansri, pg. 478, section 5.1), and wherein said method further comprises transmitting the training activity parameters to an administration unit which performs said comparing and determining based on said comparing (Waclawsky, column 4, lines 43-59).

- <Claim 5>

  The method as claimed in claim 1, wherein said determining of each training activity parameter is performed by a training activity parameter determining unit separate from the corresponding device (Waclawsky, column 1, lines 34-55).

- <Claim 6>

  The method as claimed in claim 1, further comprising determining communication- dependent dependences between at least some of the devices and services (Nuansri, pg. 478, section 5.1).

- <Claim 7>

  The method as claimed in claim 1, further comprising determining possible directional dependences with regard to directions of communication between at least some of the devices and services (Waclawsky, column 2, lines 5-11).

- <Claim 8>

  The method as claimed in claim 1, further comprising determining data of at least some of the devices and services, and wherein said determining of the training activity parameters is based on the data (Waclawsky, column 4, lines 13-40).

- <Claim 9>

  The method as claimed in claim 1, wherein said determining of the training activity parameters uses all possible pairs of the devices and pairs of services (Nuansri, pg. 475 second paragraph of section 3).

- <Claim 10>

  The method as claimed in claim 9, further comprising: storing the training activity parameters determined from the pairs of devices in a matrix; and determining the normal range of dependence from a structure of the matrix (Waclawsky, figure 4).

- <Claim 11>

  The method as claimed in claim 1, wherein at least one of the following parameters is determined as one of the training activity parameters data packets sent or received by the at least one of a corresponding device and a corresponding service, processor utilization of the corresponding device, a number of predetermined system

function calls, and existence of at least one of predetermined processes and predetermined computer programs (Waclawsky, column 5, lines 37-48).

- <Claim 13>

  The method as claimed in claim 1, further comprising generating an alarm signal when at least one device in the telecommunication network differs from the normal range of dependence in accordance with the predetermined criterion (Waclawsky, column 7, line 60 through column 8, line 6).

- <Claim 14>

  The method as claimed in claim 1, further comprising at least one of determining a disturbance of one of the devices in the telecommunication network; determining an unauthorized attempt to access one of the devices; and determining an unauthorized access attempt by one of the devices (Waclawsky, column 8, lines 31-38).

Since the combination of Waclawsky and Nuansri discloses all of the above limitations, claims 1-14 and 27-29 are rejected.

(10) Response to Argument

I. APPELLANT'S ARGUMENTS SHOULD NOT BE FOUND PERSUASIVE BECAUSE THE COMBINATION OF WACLAWSKY AND NUANSRI TEACH THE CLAIMED LIMITATIONS.

Appellant argues that Waclawsky fails to teach determining a normal range of dependence (appeal brief, pg. 8:¶3) and that Nuansri fails to teach a statistical estimator (appeal brief, pg. 8:¶4). Appellant further agues that the combination of Waclawsky and Nuansri is improper (appeal brief, pg. 10:¶3). However, contrary to Appellant's arguments,

Waclawsky and Nuansri in combination teach all the limitations as claimed and the motivation to combine the references comes from the references themselves.

A. Waclawsky teaches determining a normal range of dependence as claimed.

Appellant argues that Waclawsky fails to disclose determining from the possible dependences a normal range of dependences for at least some of the devices and services. Specifically, Appellant asserts that Waclawsky is directed towards determining from the possible dependences a benchmark data set rather than a range of values (appeal brief, pg. 9,¶4 to pg. 10,¶1). Appellant's arguments should not be found persuasive for two reasons.

First, Waclawsky does disclose determining a normal range of dependence (Figure 10B : "Peak Utilization Range," "Frame Rate/Second Range"). Second, Waclawsky's teaching of calculating of a benchmark data set also meets the limitation. Appellant argues that Waclawsky fails to "describe how the 'benchmark data set' could be used as a 'normal *range* of dependence'" (emphasis in original) (appeal brief, pg. 10,¶1).

Waclawsky discloses utilizing the benchmark data set as an outer limit of a normal range (col. 10, lines 54-66 : determining whether a network is performing outside of the limit set in the BDS or benchmark data set). Based on this teaching, one of ordinary skill in the art would have reasonably concluded that Waclawsky taught a range from zero (or no network usage) to the upper limit set by the benchmark data set. Waclawsky discloses comparing the current network activity to this limit to insure that the network is performing within desired limits (col. 10, line 66 to col. 11, line 23). For these reasons, Waclawsky discloses determining a normal range of dependence as claimed.

B. Nuansri teaches training a neural network as a statistical estimator as claimed.

Appellant argues that "[n]othing can be found in Nuansri et al. that teaches any statistical methods used to act as a statistical estimator" (emphasis removed) (pg. 8, ¶4). It should be noted that "statistical methods" are not being claimed in claim 1. The only limitations with respect to a statistical estimator describe a statistical estimator as a trained neural network (Appellant's specification, pg. 8, 0051 and claim 1) and that the statistical estimator is responsible for comparing current activity parameters with the normal range of dependence. Since these are the only limitations directed towards the statistical estimator, these are the only features that need to be taught by the prior art. The combination of Waclawsky and Nuansri discloses these features.

As discussed above, Waclawsky discloses determining from the possible dependences a normal range of dependence. Waclawsky further discloses training a rule-based network as a statistical estimator (col. 4, lines 41-54) and using this estimator to compare current activity parameters with a normal range of dependence (col. 4, line 55 to col. 5, line 4). However, Waclawsky was silent as to training a neural network as a statistical estimator.

Nuansri does disclose this feature through its teaching of the BRAINNE, or Building Representations for AI using Neural Networks (pg. 477, section 5). The BRAINNE is a hybrid of a trained neural network and rule-based network (pg. 478, section 5). Nuansri discloses that neural network techniques are useful "to learn complex, non-linear functions" (pg. 475, section 1). Nuansri further discloses that the neural network is "trained" through a learning process (pg. 477, section 5 : "...which can learn from data in the past...") to become a statistical estimator (pg. 478, section 5 : using the BRAINNE to monitor the domain name

system). For these reasons, the combination of Waclawsky and Nuansri discloses the statistical estimator as claimed.

C. The motivation to combine Waclawsky and Nuansri is supported by the prior art.

Appellant further argues that Waclawsky and Nuansri are improperly combined because they are "disparate teachings" (appeal brief, pg. 10:¶3). Beyond this conclusory statement, Appellant provides no reasoning as to why Waclawsky and Nuansri are so disparate from each other as to discourage their combination. Appellant is unable to provide any reasoning because, contrary to Appellant's unsupported assertion, Waclawsky and Nuansri are in fact intimately related to one another.

Waclawsky is directed to the real-time monitoring of a data communications network using a rule-based ("expert") system to characterize a normal range of network activity and compare current network activity to this expected normal range (abstract | col. 5, lines 5-30). Similarly, Nuansri is directed towards the use of a rule-based ("expert") system for managing and monitoring a data communications network (pg. 474, section 1 | pg. 477, section 5). Nuansri however modifies the rule-based system by including a neural network to create a hybrid system that contains aspects of both the rule-based system and the neural network (pg. 477, section 5). Nuansri discloses that a problem with a pure rule-based system such as the one taught in Waclawsky is its inability to handle network management at the application level (pg. 474, section 1). Nuansri incorporates the use of a neural network to provide support for this problem (pg. 477, section 4).

Therefore, one of ordinary skill in the art, motivated to solve the application level problems discussed in Nuansri, would have adapted Waclawsky's system to include a neural

network. Doing so would improve Waclawsky's pure rule-based system and make it better equipped to handle application level monitoring such as with DNS problems (pg. 477, section 4).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Examiner, Art Unit 2152

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